



## **Nexus Between Official Development Aid, Institutional Quality and Economic Growth: Evidence from CLMV Countries**

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### **Abstract**

This study examines the effect of country-specific Official Development Aid (ODA) and institutional quality on the economic growth of Cambodia, Laos, Myanmar, and Vietnam (CLMV) countries from 2002 to 2017. Our results indicate that: First, the impact of ODA from Germany, Japan and France on economic growth is conditional on the level of institutional quality of CLMV countries. The ODA has a negative impact on growth when institutional quality is low. Beyond a threshold of institutional quality, ODA promotes economic growth. Second, the results are robust after controlling for outliers and endogeneity in the model. This study offers some imperative policy recommendations to donor countries and ODA recipients based on the findings.

### **Keywords**

Official Development Aid; Institutional quality; Economic growth; Cambodia, Laos, Myanmar; Vietnam; Labour productivity; Human capital

### **JEL classification**

F35; O11; O43

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## I. Introduction

The amount of foreign aid received by CLMV countries, namely Cambodia, Laos, Myanmar and Vietnam, has increased significantly. Specifically, the Official Development Aid (ODA) data from World Bank shows that among ASEAN countries, CLMV countries have recorded a substantial positive net ODA from the donors from 2010 to 2017. In contrast, the remaining countries have recorded a negative net ODA in the same period. Moreover, Brunei and Singapore are no longer receiving ODA since 2005. The argument favouring foreign aid is well known and dates back to the neoclassical growth model of Solow (1956). Foreign aid increases the existing capital stocks, leading to capital deepening and higher economic growth.

Moreover, the growth-enhancing effect of foreign aid will be permanent if the foreign aid enhances the total factor productivity growth and human capital deepening in the economy. In contrast, the argument on the rent-seeking behaviour of the government views that foreign aid provides a windfall of resources, thereby escalating government corruption. This negative behaviour reduces economic growth (Djankov et al., 2008).

The theoretical ambiguity on the effect of foreign aid on economic growth is well reflected in the available empirical evidence. Some papers found that foreign aid is imperative in helping developing countries achieve higher economic growth (Sothan, 2017; Maruta et al., 2019). While the study by Mitra and Hossain (2013) and Mitra et al. (2015) discover a negative association between foreign aid and economic growth for a group of aid-receiving countries. Furthermore, some studies found an insignificant impact of foreign aid on economic growth for developing countries (Lensink and Morrissey, 2000; Young and Sheehan, 2014). The mixed findings on the effect of foreign aid on growth imply that the relationship between the two variables is conditional on the structural characteristics, such as the institutional quality of the aid-receiving countries (Brautigam and Knack, 2004; Burnside and Dollar, 2004; Kathavate and Mallik, 2012; Maruta et al., 2019).

This study examines the effect of ODA on economic growth for CLMV countries. Specifically, this study investigates the nexus between country-specific ODA on growth for CLMV countries. Furthermore, this study examines whether institutional quality plays a role in the relationship between country-specific ODA and growth for CLMV countries.

This study differs from the previous literature in two ways. First, previous literature focuses on a group of aid-receiving countries, while the empirical study on CLMV countries is somewhat limited. Likewise, the results obtained from a large group of aid-receiving countries might not be generalised to CLMV countries due to their different economic structure and institutional quality. Besides that, CLMV countries have received substantial ODA from donors in recent years. Therefore it is interesting to examine whether this considerable amount of ODA would contribute to the economic growth of CLMV countries. Next, given different levels of institutional quality compared to other aid-receiving countries, examining whether institutional quality plays a significant role in the nexus between country-specific ODA and economic growth for CLMV countries is interesting.

Second, instead of using aggregate ODA or sectoral ODA as a measure for foreign aid, this study differs from the previous study by employing the country-specific ODA, namely ODA received

from the US, Germany, UK, Japan, and France, a measure of foreign aid. The use of these five country-specific ODA is motivated by the fact that they were the top five ODA donors in 2017<sup>3</sup>. Hence, it is interesting to examine whether this massive amount of ODA would contribute to the economic growth of developing countries, particularly CLMV countries. Furthermore, country-specific ODA would provide information on which ODA received would promote economic growth for developing countries. Subsequently, the aid-receiving countries can identify the respective donors and have a greater economic collaboration to ensure the continuation of foreign aid to the country.

Based on the Fixed Effect Model (FEM), the empirical results demonstrate that: First, ODA received from the US, Germany, UK, Japan, and France has an insignificant impact on economic growth for CLMV countries. However, the relationship becomes apparent with the interaction term between country-specific ODA and institutional quality. Institutional quality mitigates the negative impact of country-specific ODA on growth. Specifically, ODA received from Germany, Japan, and France negatively impacts growth when institutional quality is low in CLMV countries. However, as institutional quality increases, the marginal effect of ODA becomes less adverse and turns positive as an institutional quality beyond a particular threshold level.

Conversely, ODA received from the US and UK are found to have an insignificant impact on economic growth at different levels of institutional quality of CLMV countries. Second, the baseline results are robust after controlling for outliers and endogeneity in the model.

This study contributes to the existing literature by suggesting an alternative model specification for the relationship between country-specific ODA and economic growth for CLMV countries. The effect of country-specific ODA on economic growth is conditional on the levels of institutional quality of CLMV countries. Therefore, future research in this area might consider including an interaction term between country-specific ODA and institutional quality in the empirical model. This interaction term enables the study to yield precise estimates and provide correct inferences on the impact of country-specific ODA on economic growth for CLMV countries.

This study has important policy implications for CLMV countries and donors. On the CLMV countries front, the results indicate the importance of institutional quality; ODA received from Germany, Japan and France as the sources of growth for the economy. Hence, a policy that strengthens the economic collaboration with Germany, France and Japan should be needed to ensure the continuation of aid assistance from those countries. With a higher inflow of foreign aid from those donors, at the same time, CLMV countries should further improve their institutional quality in order to reap the benefit of the ODA received from the three donors.

On the donor front, the result indicates that ODA received from the US and UK has an insignificant impact on growth at different levels of institutional quality of CLMV countries. This implies that the UK and US might allocate their aid again to other developing countries for more efficient utilisation of resources.

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<sup>3</sup> <http://devinit.org/wp-content/uploads/2018/04/Aid-spending-by-DAC-donors-in-2017.pdf>

This paper unfolds as follows. Section II reviews the existing studies on the nexus between foreign aid and economic growth, followed by institutional quality in the relationship between the two variables. Subsequently, the respective hypothesis will be provided. Section III illustrates the data, empirical model and methodology used in this study. Section IV presents estimation results followed by the robustness checks in section V. Section VI concludes the study with policy recommendations.

## **II. Literature review and hypothesis development**

The positive relationship between official development aid and economic growth can be explained by the neoclassical growth model of [Solow \(1956\)](#). Accordingly, the inflow of foreign aid increases the existing capital stocks, leading to capital deepening and higher economic growth. Moreover, the growth-enhancing effect of foreign aid will be permanent if the foreign aid enhances the total factor productivity growth and human capital deepening in the economy. Empirically, the study by [Hansen and Tarp \(2001\)](#); [Dalgaard et al. \(2004\)](#); [Gomanee et al. \(2005\)](#); [Fasanya and Onakoya \(2012\)](#); [Nwaogu and Ryan \(2015\)](#); [Galiani et al. \(2016\)](#); [Sothan \(2017\)](#); [Maruta et al. \(2019\)](#) support the view that foreign aid contributes to economic growth for developing countries.

In contrast, the presence of the rent-seeking behaviour of the government would result in a negative relationship between foreign aid and economic growth. Theoretically, [Djankov et al. \(2008\)](#) argue that foreign aid provides a windfall of resources, escalating rent-seeking behaviour and corruption of the government. Consequently, a high degree of corruption would bear the country's economic growth. Empirically, the study by [Mallik \(2008\)](#); [Liew et al. \(2012\)](#); [Kimura et al. \(2012\)](#); [Mitra and Hossain \(2013\)](#); [Mitra et al. \(2015\)](#); [Stojanov et al. \(2019\)](#) support the negative association between aid and economic growth for developing countries.

On the other hand, some studies found that foreign aid has no significant impact on a country's economic growth ([Lensink and Morrissey, 2000](#); [Rajan and Subramanian, 2008](#); [Khan and Ahmed, 2007](#); [Young and Sheehan, 2014](#); [Dreher and Langlotz, 2015](#)). However, the above-mentioned empirical studies focus on aggregate ODA and sectoral ODA on growth. To our knowledge, the effect of different types of country-specific ODA on aggregate growth has received little attention in the empirical literature. Despite that, the same argument can be applied to country-specific ODA, and therefore the first three hypotheses in this study are:

***H1: the effect of country-specific official development aid on economic growth is positive.***

***H2: the effect of country-specific official development aid on economic growth is negative.***

***H3: country-specific official development aid has no impact on economic growth.***

The theoretical and empirical ambiguity on the effects of foreign aid on growth implies that the relationship between the two variables is conditional on the structural characteristics such as the institutional quality of the aid-receiving countries ([Brautigam and Knack, 2004](#); [Burnside and Dollar, 2004](#); [Kathavate and Mallik, 2012](#); [Tang and Bundhoo, 2017](#); [Maruta et al., 2019](#)). Accordingly, the effects of foreign aid on growth below a certain threshold level of institutional quality are adverse due to the misallocation of resources into unproductive investment. A

government with poor institutional quality would have no incentive to act in the nation's interest and instead would inappropriately use the monetary resources for its corrupt consumption. This poor quality would have a bearing on the country's economic growth. On the other hand, better institutional quality improves macroeconomic performance by decreasing uncertainty, directing foreign aid to the most productive areas, and improving economic growth. Therefore, it is expected that if the recipient countries have good institutional quality, the marginal effect of foreign aid will be significantly positive. In contrast, the marginal effect of foreign aid will be negative if the country has poor institutional quality. As motivated by the literature on the mitigating role of institutional quality, the fourth hypothesis in the study is:

***H4: The effect of country-specific official development aid on economic growth is conditional on the institutional quality of the aid-receiving countries.***

As observed from the above-mentioned empirical studies, there is limited study on the impact of foreign aid on economic growth for CLMV countries. The existing studies mainly focus on a group of aid-receiving countries. However, the results based on a large group of countries may not be generalised to CLMV countries due to their different economic structure and institutional quality. Apart from this, CLMV countries have a substantial positive net ODA from the donors compared to neighbouring countries such as Thailand, Malaysia, the Philippines and Indonesia, which recorded a negative net ODA in recent years. Therefore, it is interesting to examine whether this considerable amount of ODA would contribute to the growth of CLMV countries. Furthermore, this study investigates the role of institutional quality in the nexus between foreign aid and economic growth. This is to ascertain whether the mitigating effect of institutional quality holds in the context of CLMV countries.

Apart from a limited study on CLMV countries, previous empirical work employs aggregate ODA and sectoral ODA to measure foreign aid. The two indicators provide useful insight into whether ODA or which sectoral ODA would result in a growth-enhancing effect for the country. However, no information can be obtained on which country-specific ODA would contribute to the country's economic growth. This type of information is important from the perspective of donors and the recipient of foreign aid. From the donor perspective, if the foreign aid is found to have an insignificant impact on the country's growth performance, the respective donor would re-allocate the fund to another country that needs the aid, allowing for efficient use of resources. From the recipient perspective, if the ODA received from a particular donor promotes economic growth, the recipient countries may consider having greater economic collaboration with the respective donor to ensure the continuation of foreign aid into the country.

In line with the above reasons, examining the impact of country-specific ODA on economic growth in CLMV countries is interesting. Moreover, it is crucial to reveal the institution's role in the nexus between foreign aid and economic growth.

### III. Data, empirical model and methodology

#### Data

This study uses unbalanced panel data from the year 2002 to 2017. The sample period selected is based on the availability of institutional quality data from the World Governance Indicator (WGI). Six WGI indicators are used to measure the overall institutions: (i) voice and accountability; (ii) political stability and absence of violence; (iii) government effectiveness; (iv) regulatory quality; (v) the rule of law; (vi) control of corruption. By following the suggestion from Law et al. (2018), the six institution indicators are re-scaled from 0 to 10, and a higher value implies better institutional quality and vice versa. The institutional indicator is obtained by summing the above six indicators. Next, the International Country Risk Guide (ICRG) does not provide Cambodia and Laos's institutional index. Therefore the database will not be used in this study.

This study employs the ODA received from the US, Germany, UK, Japan, and France for country-specific ODA. These five countries were the top five ODA donors in 2017<sup>4</sup>. Given this enormous amount of aid given to developing countries, it is interesting to examine whether the aid would positively impact growth for aid-receiving countries, particularly CLMV countries. Table 1 shows the list of variables used in this study.

Table 1: List of variables

Variables	Descriptions	Unit of measurement	Source
GDP	The real GDP growth rate	Annual %	WDI
US	ODA received from the US	% of GDP	WDI
Germany	ODA received from Germany	% of GDP	WDI
UK	ODA received from the UK	% of GDP	WDI
Japan	ODA received from Japan	% of GDP	WDI
France	ODA received from France	% of GDP	WDI
INS	Institutional quality	Scaled from 0 to 100	WGI
GCF	Gross capital formation	% of GDP	WDI
Population	Population growth rate	Annual %	WDI
Openness	Trade openness	% of GDP	WDI
Inflation	Inflation rate	Annual %	WDI

Notes: WDI indicates World Development Indicator.

WGI indicates Worldwide Governance Indicator

Sample period: 2002-2017.

#### Empirical model

The following equation will be used to assess the relationship between country-specific ODA and economic growth for CLMV countries:

$$GDP_{it} = \beta_0 + \beta_1 ODA_{it} + \beta_2 INS_{it} + \beta_3 GCF_{it} + \beta_4 Population_{it} + \beta_5 Openness_{it} + \beta_6 Inflation_{it} + v_i + \varepsilon_{it} \quad (1)$$

Where GDP represents the growth rate of real GDP. The ODA is a vector of country-specific official development aid (ODA). The INS refers to the institutional quality index.

<sup>4</sup> <http://devinit.org/wp-content/uploads/2018/04/Aid-spending-by-DAC-donors-in-2017.pdf>

For the control variable, GCF is the gross capital formation; population refers to the population growth rate, openness is the trade openness and lastly, the inflation rate. Including those variables enables the model to capture the effect of investment, demographic changes, globalisation, and price changes on economic growth. Moreover,  $v_i$  is the unobserved country-specific effect term,  $\varepsilon_{it}$  is the error term,  $i$  is the country index, and  $t$  is the time index.

The coefficient  $\beta_1$  in Eq. (1) measures the effect of country-specific ODA on economic growth. However, Eq. (1) may suffer from misspecification errors, given that the impact of foreign aid on growth is conditional on the institutional quality of the recipient country, as indicated by the above-mentioned empirical studies. Hence, to capture the effect of institutional quality in the relationship between foreign aid and economic growth, this study extends Eq. (1) by including an interaction term as follows:

$$GDP_{it} = \beta_0 + \beta_1 ODA_{it} + \beta_2 INS_{it} + \beta_3 ODA_{it} * INS_{it} + \beta_4 GCF_{it} + \beta_5 Population_{it} + \beta_6 Openness_{it} + \beta_7 Inflation_{it} + v_i + \varepsilon_{it} \quad (2)$$

By including the interaction term as in Eq. (2), the marginal effects of country-specific ODA on economic growth depend on  $\beta_3$ . That is:

$$\frac{\partial GDP_{it}}{\partial ODA_{it}} = \beta_1 + \beta_3 INS_{it} \quad (3)$$

By following the suggestion from [Brambor et al. \(2006\)](#) and [Ibrahim \(2019a\)](#), this study computes and graph the marginal effects of country-specific ODA across different values of institutional quality. This graph provides a clear picture of the effect of country-specific ODA on economic growth at a different level of institutional quality of the recipient country.

### Research Methodology

Given the insignificant lagged economic growth in the empirical model, this study employs the static panel method to estimate Eq. (1) and (2). The model selection tests (Breusch-Pagan Lagrangian Multiplier test, Poolability F-test and Hausman test) show that the Fixed Effect Model (FEM) is appropriate in the context of this study. The robust standard error is computed for the FEM. It is used to overcome the heteroscedasticity and autocorrelation in the model.

Next, two robustness checks have been conducted to ensure the validity of the baseline results: First, this study control for the effects of an outlier by using the cook distance test. Alternatively, the winsorisation technique will be used, which removes the outlier inherited in the data at the 5th and 95th percentiles. This step is to ensure the results are robust to different outlier tests.

Second, this study uses the Two-Stage Least Square (2SLS) method to address the endogeneity issue that arises from the reverse causality between dependent and independent variables. In the practical implementation of 2SLS, the lagged values of explanatory variables will be used as the instrumental variable. The rationale for the practice is explicitly identified in statements such as the following: "We avoid poor-quality instrumental variables and instead address potential biases from reverse and simultaneous causation by ... lagging" ([Clemens, Radelet, Bhavnani and Bazzi,](#)

2012); and "The variable is expressed as a percentage of GDP. The lagged variable was used in both cases to avoid possible simultaneity problems" (Vergara, 2010). Notably, the practice is shared across a wide variety of disciplines in economics and finance in order to mitigate endogeneity issues in the model (Green Malpezzi and Mayo, 2005; Gupta, 2005; Mackay and Phillips, 2005; Brinks and Coppedge, 2006; Jensen and Paldam, 2006; Buch, Koch and Koetter, 2013; Ibrahim, 2019b).

#### IV. Estimation results

##### Descriptive statistics

Table 2 shows the descriptive statistics for all the variables used in this study. Despite being the top 5 ODA donors in 2017, on average, the ODA contributed by the US, Germany, UK, Japan, and France constitute less than 1 per cent of the Gross Domestic Product (GDP) of CLMV countries. For instance, ODA received from Japan constitutes 0.9 per cent of the GDP of CLMV countries. This result indicates that ODA received from the five donors may have a negligible impact on the economic growth of CLMV countries.

Table 2: Descriptive statistics

Variables	Mean	Standard deviation	Skewness	Kurtosis	Observation
GDP	7.823	2.409	0.631	4.697	64
US	0.239	0.259	1.139	2.793	64
Germany	0.192	0.146	0.315	1.764	64
UK	0.091	0.091	0.918	2.407	64
Japan	0.910	0.652	2.002	10.892	64
France	0.200	0.186	1.287	5.492	64
INS	44.914	21.593	0.447	2.392	64
GCF	27.614	6.244	-0.293	1.998	58
Population	1.229	0.373	-0.142	1.436	64
Openness	93.933	55.531	-0.356	2.132	64
Inflation	8.631	9.789	2.864	12.441	64

Notes: Sample period: 2002-2017. All statistics are based on original data values.

Table 3 shows the correlation matrix for all the variables used in this study. Notably, all the country-specific ODA, except for ODA received from Japan, are positively correlated with economic growth. However, the relationship between the two variables is weak, whereby all the correlation values are less than 0.5. This indicates that country-specific ODA has a negligible impact on the economic growth of CLMV countries. The descriptive statistics in Table 2 show that the amount of ODA received from the five donors is minimal. Therefore it is expected to have a negligible impact on economic growth. Next, all the explanatory variables have a correlation value of less than 0.8, indicating the absence of multicollinearity in the model.



Table 3: Correlation matrix

Variables	<b>GDP</b>	<b>US</b>	<b>Germany</b>	<b>UK</b>	<b>Japan</b>	<b>France</b>
GDP	1.000					
US	0.205	1.000				
Germany	0.118	0.414	1.000			
UK	0.165	0.567	0.023	1.000		
Japan	-0.010	0.234	0.329	0.152	1.000	
France	0.124	0.322	0.443	0.098	0.797	1.000
INS	-0.198	0.043	0.024	-0.122	-0.057	-0.231
GCF	-0.280	-0.763	-0.204	-0.398	-0.073	-0.128
Population	0.068	0.586	0.782	-0.135	0.423	0.564
Openness	-0.018	0.192	0.009	-0.119	0.058	0.040
Inflation	0.051	-0.152	-0.113	0.159	-0.030	0.004
	<b>INS</b>	<b>GCF</b>	<b>Population</b>	<b>Openness</b>	<b>Inflation</b>	
INS	1.000					
GCF	0.082	1.000				
Population	0.088	-0.369	1.000			
Openness	0.173	-0.035	0.228	1.000		
Inflation	-0.399	0.038	-0.244	-0.036	1.000	

Notes: Sample period: 2002-2017. All statistics are based on original data values.

### Baseline results

Tables 4 and 5 present the baseline results for the model without interaction term (Eq. (1)) and with interaction term (Eq. (2)), respectively. By focusing on the model without interaction terms, Table 4 shows that all the country-specific ODA have an insignificant impact on the economic growth of CLMV countries. The findings reaffirm the result in the correlation matrix earlier, in which the ODA received from the five donors is found to have a weak association with economic growth. Therefore, it is expected to have no impact on economic growth for CLMV countries. In this regard, the results support hypothesis 3 earlier, whereby country-specific ODA is found to have no significant impact on CLMV economic growth. Empirically, the results are in line with earlier findings by [Lensink and Morrissey \(2000\)](#), [Young and Sheehan \(2014\)](#), [Dreher and Langlotz \(2015\)](#), in which foreign aid has no impact on economic growth.

Table 4: Baseline results for Eq. (1): without the interaction term

Variables	(1)	(2)	(3)	(4)	(5)
US	1.997 (1.805)				
Germany		-3.445 (3.664)			
UK			-9.016 (8.645)		
Japan				-0.372 (0.505)	
France					-1.065 (2.347)
INS	-0.023 (0.029)	-0.016 (0.029)	0.001 (0.016)	-0.019 (0.031)	-0.022 (0.032)
GCF	-0.124 (0.125)	-0.126 (0.117)	-0.127 (0.112)	-0.128 (0.120)	-0.124 (0.132)
Population	-2.278 (4.347)	-1.854 (4.195)	-4.064* (1.665)	-1.626 (4.430)	-1.568 (5.206)
Openness	0.041* (0.016)	0.050** (0.022)	0.056* (0.033)	0.046** (0.020)	0.044* (0.018)
Inflation	-0.109 (0.069)	-0.102 (0.065)	0.079 (0.082)	-0.087 (0.065)	-0.095 (0.062)
Constant	9.463 (5.536)	8.527 (6.051)	9.182* (5.136)	8.671 (6.280)0	8.941 (7.061)
Observation	58	58	58	58	58
Time dummy	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results above are estimated based on the FEM model with robust standard error.

Sample period: 2002-2017

However, as shown in Table 4, the results hold when there is no government intervention in the economy. In other words, the baseline result in Table 4 examines the relationship between country-specific ODA and economic growth without considering the institution's role in the economy. As pointed out by [Brautigam and Knack \(2004\)](#), [Burnside and Dollar \(2004\)](#), [Kathavate and Mallik \(2012\)](#) and [Maruta et al. \(2019\)](#), institution plays an essential role in the relationship between foreign aid and economic growth. Accordingly, a country with low institutional quality would result in rent-seeking behaviour and misallocation of resources into an unproductive investment, thereby reducing the country's economic growth. Conversely, a country with high institutional quality would efficiently use foreign aid, whereby the resources will improve the nation's productivity growth and human capital development. This contributes to economic growth for the aid-receiving country. Thus, it can be argued that the effect of foreign aid on economic growth is conditional on the level of institutional quality of the aid-receiving country.

In this regard, the failure to capture institutional quality's role in the nexus between foreign aid and economic growth would result in a misspecification error in the empirical model. Likewise, incorrect inferences will be made on the relationship between foreign aid and economic growth. In line with these reasons, Eq. (1) is extended by including an interaction term between country-specific ODA and institutional quality as in Eq. (2). The interaction term allows the model to examine the effect of country-specific ODA on growth on different levels of institutional quality, thereby providing correct inferences on the effect of country-specific ODA on growth for CLMV countries.

Table 5 shows the baseline results for Eq. (2). Brambor et al. (2006) noted that it is wrong to interpret the coefficients on country-specific ODA and institutional quality if the model contains an interaction term. As such, the coefficients of country-specific ODA only capture the effect of foreign aid on growth when institutional quality is zero. Similarly, the coefficients of institutional quality indicate the effects of institutional quality on economic growth when country-specific ODA does not exist. Thus, the coefficients for country-specific ODA and institutional quality are not highlighted in Table 5. Results obtained from the interaction term will be used for inferences.

It can be observed that interaction terms like Germany\*INS, Japan\*INS and France\*INS are positive and statistically significant. The result implies that institutional quality mitigates the insignificant effect of country-specific ODA on economic growth. For concreteness, this study plots the marginal effect of country-specific ODA on economic growth across different levels of institutional quality of CLMV countries.

Figure 1 plots the marginal effect of ODA from the US on economic growth at a different level of institutional quality of CLMV countries. In explaining Figure 1, when institutional quality is at the minimum, ODA received from the US is found to have an insignificant impact on economic growth. However, as the institutional quality increases and beyond a particular threshold, the marginal effect of ODA from the US becomes positive and significant.

While for the ODA received from Germany (Figure 2), Japan (Figure 4), and France (Figure 5), the effect on growth is negative when institutional quality is at the minimum level. However, the negative impact becomes less apparent and positive as institutional quality increases. In contrast, ODA received from the UK is found to have no impact on economic growth at different levels of institutional quality (Figure 3). Overall, the marginal effect diagram demonstrates that increasing institutional quality would moderate the negative relationship between country-specific ODA and economic growth for CLMV countries. The results support hypothesis 4 above, whereby the effect of country-specific ODA on growth is conditional on the level of institutional quality of the aid-receiving country. Likewise, the results are in line with the empirical finding by [Brautigam and Knack \(2004\)](#), [Burnside and Dollar \(2004\)](#), [Kathavate and Mallik \(2012\)](#) and [Maruta et al. \(2019\)](#).

Table 5: Baseline results for Eq. (2): with an interaction term

Variables	(1)	(2)	(3)	(4)	(5)
US	-2.852 (3.845)				
Germany		-21.879** (5.752)			
UK			6.881 (9.496)		
Japan				-3.781** (1.058)	
France					-18.030** (3.862)
INS	-0.062 (0.063)	-0.089* (0.037)	-0.197 (0.031)	-0.093 (0.043)	-0.084* (0.028)
US*INS	0.128 (0.086)				
Germany*INS		0.377** (0.075)			
UK*INS			-0.158 (0.161)		
Japan*INS				0.076** (0.021)	
France*INS					0.354*** (0.043)
GCF	-0.120 (0.098)	-0.089 (0.040)	-0.054 (0.106)	-0.080 (0.080)	-0.075 (0.075)
Population	-5.875** (1.518)	0.199 (2.051)	-0.770 (4.458)	-1.667 (1.518)	-1.875 (3.300)
Openness	0.075** (0.037)	0.082** (0.024)	0.041 (0.041)	0.064* (0.023)	0.080** (0.017)
Inflation	-0.157* (0.051)	-0.030 (0.031)	-0.022 (0.021)	-0.024 (0.052)	-0.030** (0.013)
Constant	11.739* (3.731)	5.357 (2.745)	6.591 (8.269)	9.333** (2.178)	7.695** (3.267)
Observation	58	58	58	58	58
Time dummy	Yes	Yes	Yes	Yes	Yes

Notes: Robust Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results above are estimated based on the FEM model with robust standard error.

Sample period: 2002-2017

The baseline results highlight the institution's role in the nexus between country-specific ODA and economic growth for CLMV countries. Moreover, the baseline results provide information on which country-specific ODA is the source of growth for CLMV countries. In particular, ODA received from the US, Germany, Japan, and France would contribute to economic growth when there is a high level of institutional quality in CLMV countries. However, when institutional quality is at a low level, foreign aid from the four donors reduces economic growth for CLMV countries. Next, robustness checks are conducted to ensure the validity of the mitigating effect of institutional quality. Given that the model with an interaction term has the correct specification, robustness checks will be conducted solely on the model with an interaction term (Eq. (2)).

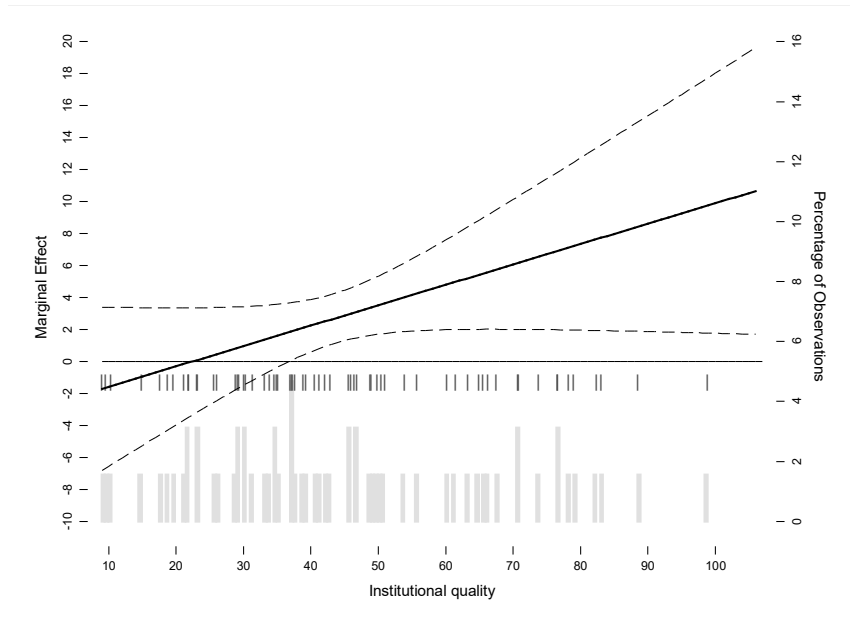


Figure 1: Marginal effect of ODA received from the US on economic growth  
 Notes: The figure provides a 90% confidence interval and the frequency distribution (histogram) of institutional quality in the background.

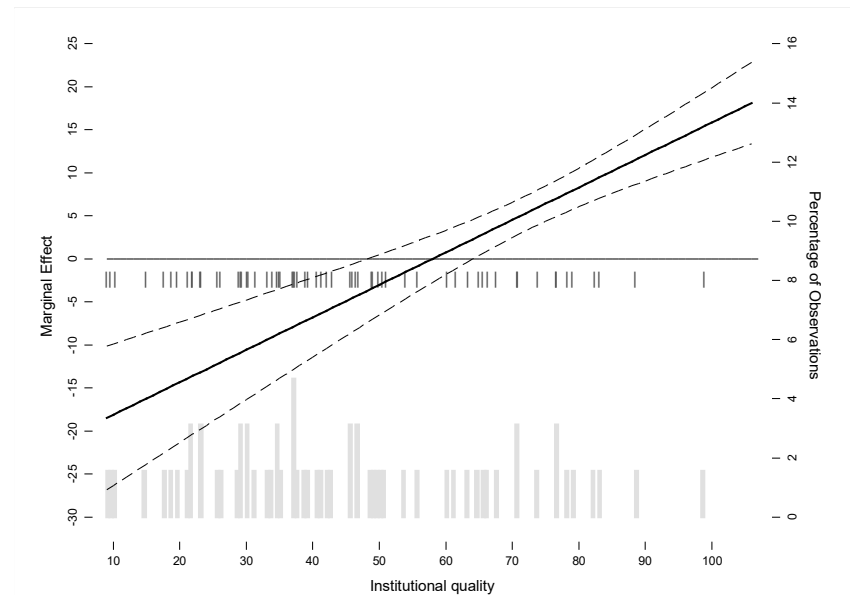
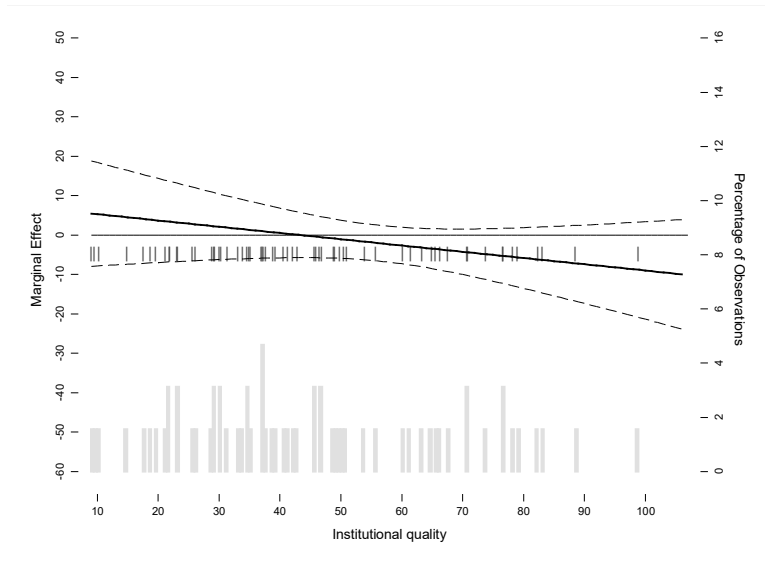
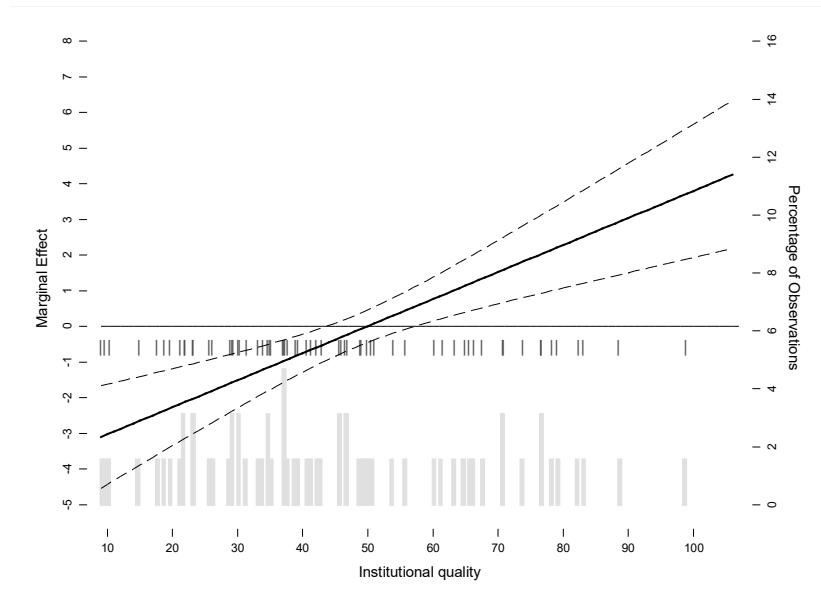


Figure 2: Marginal effect of ODA received from Germany on economic growth  
 Notes: The figure provides a 90% confidence interval and the frequency distribution (histogram) of institutional quality in the background.



**Figure 3: Marginal effect of ODA received from the UK on economic growth**  
 Notes: The figure provides a 90% confidence interval and the frequency distribution (histogram) of institutional quality in the background.



**Figure 4: Marginal effect of ODA received from Japan on economic growth**  
 Notes: The figure provides a 90% confidence interval and the frequency distribution (histogram) of institutional quality in the background.

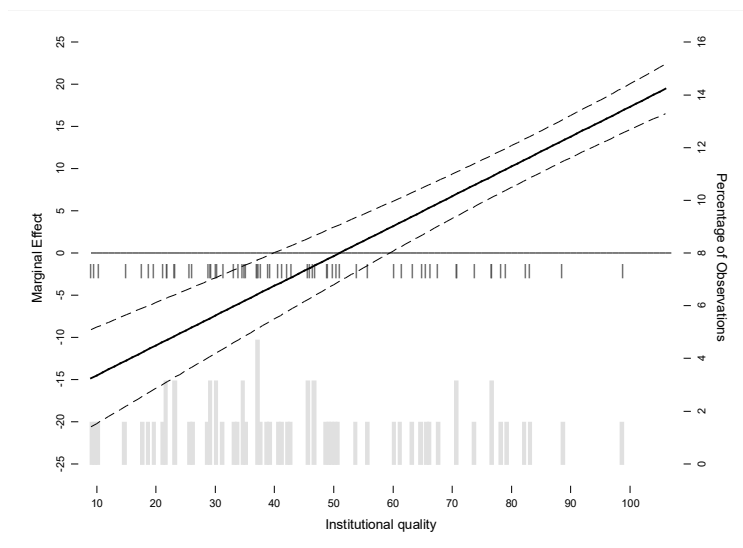


Figure 5: Marginal effect of ODA received from France on economic growth

Notes: The figure provides a 90% confidence interval and the frequency distribution (histogram) of institutional quality in the background.

## V. Robustness checks

### Control for outliers

The first robustness check addresses the presence of outliers in the data. The outliers in the dataset would lead to inaccurate estimation and biased results. Therefore, this study employs a cook distance test to remove the outliers inherent in the data. Likewise, to ensure the results are robust to different outlier tests, this study winsorise the observations in both tails of the empirical distribution over the whole sample period. As such, this study winsorises all dependent and independent variables in Eq. (2) at the 5th and 95th percentiles. Tables 6 and 7 show the corresponding results.

Notably, the mitigating effect of institutional quality remains robust after removing the outliers in the data. In particular, the coefficients of Germany\*INS, Japan\*INS and France\*INS are positive and statistically significant. Moreover, the marginal effect diagram for those interaction terms demonstrates that foreign aid reduces growth when institutional quality is low. However, the effect becomes positive when CLMV countries achieve a high level of institutional quality. While the marginal effect diagram for ODA received from US and UK show that foreign aid has no impact on growth at different levels of institutional quality of CLMV countries. The diagrams of marginal effect are not reported here to conserve space, but they are available upon request.

By and large, the baseline results are not affected by outliers and are robust across different choices of outlier tests. As such, institution quality is vital in mitigating the negative relationship between country-specific ODA and economic growth. In particular, ODA received from Germany, Japan, and France would result in a growth-enhancing effect if CLMV countries achieve a high level of institutional quality. Moreover, the results highlight the importance of ODA from Germany, Japan and France as the source of growth for CLMV countries.

Table 6: Robustness check for Eq. (2). Control for outlier: Cook distance test

Variables	(1)	(2)	(3)	(4)	(5)
US	-1.685 (2.667)				
Germany		-13.706*** (2.223)			
UK			13.038* (4.952)		
Japan				-3.281*** (0.466)	
France					-11.050** (2.323)
INS	-0.031 (0.041)	-0.055* (0.017)	0.019* (0.008)	-0.049 (0.025)	-0.050*** (0.006)
US*INS	0.053 (0.075)				
Germany*INS		0.256*** (0.024)			
UK*INS			-0.270** (0.070)		
Japan*INS				0.045** (0.013)	
France*INS					0.229** (0.045)
GCF	-0.053 (0.052)	-0.091** (0.018)	-0.052 (0.051)	-0.088** (0.017)	-0.046 (0.046)
Population	-4.640 (2.152)	-2.903 (1.522)	-1.294 (0.812)	-2.367 (1.343)	-4.235** (1.157)
Openness	0.046 (0.033)	0.054** (0.012)	0.015 (0.016)	0.039* (0.012)	0.057*** (0.008)
Inflation	-0.123 (0.070)	-0.065 (0.033)	0.040 (0.037)	-0.030 (0.052)	-0.086* (0.033)
Constant	11.022** (2.376)	10.295** (2.622)	7.463** (1.652)	11.474*** (1.303)	10.052*** (1.473)
Observation	53	56	53	54	53
Time dummy	Yes	Yes	Yes	Yes	Yes

Notes: Robust Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results above are estimated based on the FEM model with robust standard error.

Sample period: 2002-2017



Table 7: Robustness check for Eq. (2). Control for outliers: Winsorisation

Variables	(1)	(2)	(3)	(4)	(5)
US	-3.416 (2.909)				
Germany		-16.018*** (2.37)			
UK			15.524* (6.329)		
Japan				-2.909* (0.936)	
France					-14.767*** (1.395)
INS	-0.041 (0.034)	-0.074* (0.024)	0.035*** (0.003)	-0.051 (0.029)	-0.065** (0.015)
US*INS	0.081 (0.060)				
Germany*INS		0.301*** (0.022)			
UK*INS			-0.421*** (0.056)		
Japan*INS				0.043** (0.013)	
France*INS					0.249*** (0.026)
GCF	-0.073 (0.076)	-0.146** (0.031)	-0.074 (0.087)	-0.136** (0.065)	-0.121 (0.060)
Population	-5.023* (1.989)	-1.933 (2.069)	-0.141 (1.222)	-0.701 (0.546)	-3.036* (0.973)
Openness	0.064** (0.030)	0.080** (0.014)	0.041** (0.016)	0.063** (0.017)	0.079*** (0.007)
Inflation	-0.136* (0.055)	-0.070* (0.039)	-0.030 (0.049)	-0.055 (0.036)	-0.073*** (0.014)
Constant	13.691*** (1.136)	9.061* (2.909)	3.086* (1.676)	8.157** (1.499)	9.796*** (1.272)
Observation	58	58	58	58	58
Time dummy	Yes	Yes	Yes	Yes	Yes

Notes: Robust Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results above are estimated based on the FEM model with robust standard error.

Sample period: 2002-2017

### Control for endogeneity

The second robustness check addresses the issue of reverse causality in the empirical model of Eq. (2). As such, empirical evidence shows the possibility of causality from economic growth to institutional quality (Chong and Calderon, 2000; Kebede and Takyi, 2017) and economic growth to official development aid (Mahembe and Odhiambo, 2019). Consequently, this would lead to the endogeneity issue in the model. Moreover, the endogeneity of official development aid and institutional quality would carry over to the interaction term. There will be bias in estimating parameters, causing incorrect inferences on the mitigating effect of institutional quality. This study employs the Two-Stage Least Square method (2SLS) to mitigate incorrect inferences. In the practical implementation, the lag one values of country-specific ODA, institutional quality and the interaction term between the two variables will be used as the instrumental variable.

Table 8 shows the estimation results of the Two-Stage Least Square method. The results are consistent with the findings above. Notably, the coefficients for Germany\*INS, Japan\*INS and France\*INS remain positive and significant at a 1 per cent level. The marginal effect diagram reaffirms the role of institutional quality in mitigating the negative relationship between country-specific ODA (ODA received from Germany, Japan and France) and economic growth for CLMV countries. The results also indicate that ODA from Germany, France, and Japan are the sources of growth for CLMV countries.

Moreover, ODA received from US and UK are found to have an insignificant influence on economic growth at different levels of institutional quality. The diagrams are not reported here to conserve space but are available upon request. Overall, the estimation results from the Two-Stage Least Square method are similar to the baseline results. Therefore, the baseline results are robust against different estimation methods.

Table 8: Robustness check for Eq. (2). Estimation method: Two-Stage Least Square.

Variables	(1)	(2)	(3)	(4)	(5)
US	-14.216* (7.374)				
Germany		-22.311*** (7.592)			
UK			7.954 (8.521)		
Japan				-6.538*** (2.388)	
France					-26.667*** (8.575)
INS	-0.152 (0.192)	-0.104*** (0.029)	0.030 (0.039)	-0.098*** (0.036)	-0.088*** (0.026)
US*INS	0.399 (0.360)				
Germany*INS		0.503*** (0.127)			
UK*INS			-0.272 (0.170)		
Japan*INS				0.119*** (0.046)	
France*INS					0.504*** (0.166)
GCF	-0.122 (0.131)	-0.110*** (0.034)	-0.942* (0.050)	-0.072* (0.044)	-0.069* (0.041)
Population	-11.689 (9.794)	2.975 (4.396)	2.854 (5.072)	5.753 (5.442)	4.039 (4.895)
Openness	0.155 (0.113)	0.080*** (0.018)	0.164 (0.020)	0.066*** (0.016)	0.088*** (0.019)
Inflation	-0.232 (0.223)	0.036 (0.068)	0.050 (0.082)	0.115 (0.103)	0.080 (0.084)
Observation	55	55	55	55	55
Time dummy	Yes	Yes	Yes	Yes	Yes

Notes: Robust Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

All the results above are estimated based on Two-Stage Least Square with robust standard error.

Sample period: 2002-2017

Hence, results indicate that institutional quality plays a vital role in the relationship between country-specific ODA and economic growth for CLMV countries. In particular, ODA received from Germany, Japan, and France would negatively impact growth when institutional quality is at a low level. In contrast, the growth effect of foreign aid turns out to be positive when CLMV countries achieve a high level of institutional quality. While ODA received from US and UK are found to have an insignificant impact on growth at different levels of institutional quality of CLMV countries. Thus, the results highlight the importance of institutional quality and the ODA received from Germany, Japan and France as the sources of growth for CLMV countries.

## **VII. Conclusion**

This paper establishes several empirical findings regarding the nexus between country-specific Official Development Aid (ODA) and economic growth for CLMV countries from 2002 to 2017. First, results show that ODA received from the US, Germany, the UK, Japan, and France has an insignificant impact on economic growth for CLMV countries. However, the relationship becomes apparent after including an interaction term between country-specific ODA and institutional quality in the model. Institutional quality mitigates the adverse impact of country-specific ODA on growth.

It is found that ODA received from Germany, Japan, and France yields a negative impact on growth when institutional quality is at a low level in CLMV countries. However, as institutional quality increases, the marginal effect of ODA becomes less adverse. Beyond a particular threshold of institutional quality, ODA from the three donors promotes economic growth for CLMV countries. While ODA received from US and UK, yield insignificant impact on economic growth. The results are robust after controlling for the effect of outliers and endogeneity in the model.

The results have important implications from the perspective of future academic research, policymaking in CLMV countries and the allocation of foreign aid from the donors. On the academic front, this study shows that the relationship between country-specific ODA and economic growth for CLMV countries is conditional on the levels of institutional quality of CLMV countries. This provides an alternative model specification on the relationship between country-specific ODA and economic growth for CLMV countries. Therefore, future research in this area might consider having an interaction term between country-specific ODA and institutional quality in the empirical model. This allows the study to yield precise estimates and provide correct inferences on the impact of country-specific ODA on economic growth for CLMV countries.

ODA received from Germany, France and Japan as the sources of growth for the economy. Therefore, a policy that strengthens the economic collaboration with Germany, France and Japan is needed to ensure the continuation of aid assistance from those countries. At the same time, CLMV countries should improve their institutional quality to reap the benefit of the ODA from the three donors.

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